

ABSTRACT OF THE DISCLOSURE

5 An apparatus for a hydrocarbon reforming process includes a combustion chamber, a convection chamber in fluid communication with the combustion chamber, at least one burner disposed in the combustion chamber, a reaction chamber, a means for flowing a first mixed-feed through a first part of the reaction chamber, and a means for flowing a second mixed-feed through an annular portion of a second part of the reaction
10 chamber, the second part being a tube-in-tube in fluid communication with the first part. The burner(s) generates a flow of a flue gas having a sensible heat from the combustion chamber to the convection chamber. The flow of the flue gas in the convection chamber is counter-currently with the flow of the second mixed-feed.